

CANTHARIDIN ATTRACTION IN *PYROCHROA* (COLEOPTERA: PYROCHROIDAE)¹

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ABSTRACT: A new case of probable cantharidin attraction in beetles of the genus *Pyrochroa* is recorded. Observed feeding on blister beetle tissues is related to possible cantharidin transfer during copulation as demonstrated in other pyrochroine Pyrochroidae.

Cantharidin is a toxic terpenoid present in the haemolymph and tissues of Meloidae and Oedemeridae beetles, with probable intraspecific attractive function, at least in blister beetles, and representing a feeding deterrent against vertebrates (except in a few cases, e.g. toads) and predaceous arthropods. Nevertheless, cantharidin is strongly attractive to several species of insects of different orders, particularly other tenebrionoid Coleoptera. A recent review on canthariphily was published by Dettner (1997).

The first records of cantharidin attraction in pyrochroine Pyrochroidae were published for three Nearctic species by Young (1984a, 1984b): *Schizotus cervicalis* Newman, *Neopyrochroa femoralis* (LeConte), and *N. flabellata* (Fabricius). This phenomenon was observed in two Palaearctic species: *Pyrochroa serraticornis serraticornis* (Scopoli) by Bologna and Havelka (1985, without subspecies association), and *Schizotus pectinicornis* (Linnaeus) by Holz et al. (1994).

The new observation of attraction concerns one male of *P. s. serraticornis* from Latium, Cisterna di Latina, Italy (Latina Province, UTM 33TUG198068, April 8 1991, G. Nardi leg., 2:15 PM), found on a dead male of *Meloe* (*Meloe*) *proscarabaeus* Linnaeus used as bait under hazel trees (*Corylus avellana* Linnaeus). This blister beetle was collected in the same locality a few days earlier (April 2 1991, G. Nardi leg.).

The single previous record of this *Pyrochroa* species, published by Bologna and Havelka (1985: Latium Apennines), reported a male displaying courtship behavior on a *Meloe* (*Meloe*) *violaceus* Marsham male, which itself was simultaneously in homospecific courtship. The new record concerns a male of *P. serraticornis* feeding on the first abdominal sternites of the blister beetle; feeding continued for one hour in a rearing box.

The cantharidin assumption was recorded in males of *N. flabellata* and *S. pectinicornis* (cf. Dettner, 1997 for a review and detailed literature). Males store cantharidin chiefly in the reproductive apparatus and can secrete it through

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a cephalic exocrine gland. Females, during courtship, check the presence of this substance in this gland and copulate with a male having a higher load of cantharidin; most of this stored substance is transferred during copulation into the female spermatheca. Females can transfer cantharidin to the eggs and consequently larvae are protected against predators.

Pyrochroidae of the subfamily Pedilinae (considered as a distinct family by some authors), and other beetles of the families Anthicidae, Endomychidae, Staphylinidae and Chrysomelidae also have been recorded in the field feeding on Meloidae and Oedemeridae tissues (cf. Dettner, 1997 for a review on the significance of this behavior).

Based on the new feeding record in *P. serraticornis*, and the presence of the cephalic gland at least in the closely related *P. coccinea* (Linnaeus) (Schütz and Dettner, 1992), we suspect that cantharidin transfer during copulation also occurred in *Pyrochroa*. This phenomenon could also be particularly significant because fire-colored beetles of this genus have repellant glands with unknown chemical products, and could represent model species in mimicry complexes with other beetles such as Elateridae (Liberto, 1993) and Lycidae (Bologna and Nardi, unpubl.).

LITERATURE CITED

- Bologna, M. A. and P. Havelka. 1985. Nuove segnalazioni di attrazione della cantaridina dei Meloidae su Coleotteri e Ditteri. Boll. Assoc. Romana Entomol. 39 (1984): 77-82.
- Dettner, K. 1997. Inter- and Intraspecific Transfer of Toxic Insects Compound Cantharidin: 115-145. In: Dettner K. et al. (eds.), Vertical Food Web Interactions. Ecol. Studies, 130.
- Holz, C., G. Streil, K. Dettner, J. Dütemeyer and W. Boland. 1994. Intersexual Transfer of a Toxic Terpenoid during Copulation and its Paternal Allocation to Developmental Stages: Quantification of Cantharidin in Cantharidin-Producing Oedemerids (Coleoptera: Oedemeridae) and Canthariphilous Pyrochroids (Coleoptera: Pyrochroidae). Z. Naturforsch. 49c: 856-864.
- Liberto, A. 1993. Osservazioni sistematiche ed eco-etologiche su *Anostirus* (*Parastirus*) *cerrutii* Binaghi (Coleoptera, Elateridae). Boll. Assoc. Romana Entomol. 47 (1992): 81-85.
- Schütz, C. and K. Dettner. 1992. Cantharidin-secretion by elytral notches of male Anthicid species (Coleoptera: Anthicidae). Z. Naturforsch. 47c: 290-299.
- Young, D. K. 1984a. Field studies on cantharidin orientation by *Neopyrochroa flabellata* (Coleoptera: Pyrochroidae). Great Lakes Entomol. 17: 133-135.
- Young, D. K. 1984b. Field records and observations of Insects associated with cantharidin. Great Lakes Entomol. 17: 195-199.